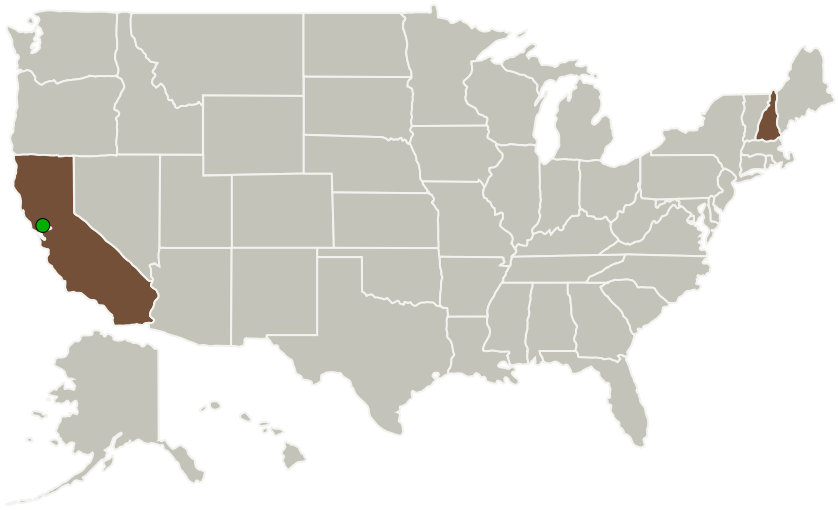
Miniature Reaction Wheel for Small Satellite Control, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

The overall goal of this project is to design, develop, demonstrate, and deliver a miniature, high torque, low-vibration reaction wheel for use on small satellites. Creare's miniature reaction wheel has the potential to revolutionize the design and operation of small satellites (i.e., mass from less than 1 kg up to 500 kg). Currently available reaction wheels are too large and heavy, and miniature reaction wheels do not provide sufficient control authority for use on small satellites. This primarily results from the need to greatly increase the speed of rotation of the flywheel in order to reduce the flywheel size and mass. We will achieve this goal by making use of our unique, proprietary, space-qualified, high-speed motor technology to spin the flywheel at a speed much faster than the other known miniature reaction wheels either under development or currently available. This will enable the fabrication of a miniature reaction wheel with greatly improved performance and smaller size. Creare is particularly well qualified to lead this effort given our considerable and unique past experience in miniaturizing devices for use in important space missions, our firm's longevity, and the space-qualified fabrication facilities that we maintain.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Creare LLC	Lead Organization	Industry	Hanover, New Hampshire
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	New Hampshire

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Summary: Miniature Reaction Wheel for Small Satellite Control, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139233)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Creare LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

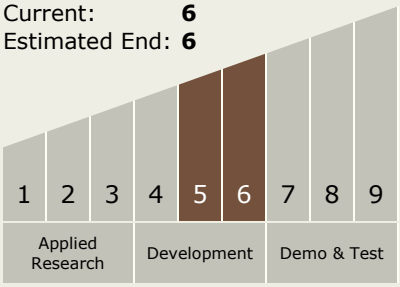
Carlos Torrez

Principal Investigator:

Robert K Schoder

Technology Maturity (TRL)

Start: **5**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.3 Control Technologies
    - TX17.3.4 Control Force/Torque Actuators

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System